

SECTION 503 SUBDRAINAGE

503.1 GENERAL

The work performed under this specification shall include, but not limited to providing the equipment, labor and materials for the excavation, installation and backfilling of subdrainage improvements as specified on the plans and herein or as authorized by the ENGINEER.

SIEVE SIZE	% PASSING
3 inch	100
1/2 inch	70 - 100
no. 4	50 - 80
no. 16	25 - 50
no. 50	5 - 15
no. 100	0 - 15
Liquid Limit	NV (no value)
Plasticity Index	NP (non-plastic)

503.2 REFERENCES

503.2.1 American Society for Testing Materials (Latest Edition)(ASTM)

F758 Smooth Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain System for Highways, Airports, and Similar Drainage

503.2.2 This Publication:

Section 101 Portland Cement Concrete
Section 121 Plastic Pipe
Section 920 Sanitary and Storm Sewer Manholes
Section 1502 Submittals

**The drain material shall comply with the following material size ratios:

$$12 < / = R50 < / = 58$$

$$R50 = \frac{50\text{-percent size GDM}}{50\text{-percent size BM}}$$

$$12 < / = R15 < / = 40$$

$$R15 = \frac{15\text{-percent size GDM}}{15\text{-percent size BM}}$$

where

GDM-represents the Gravel Drain Material
BM -represents the Base Material (surrounding soil)

503.4 SUBDRAINAGE PIPE

Subdrain pipe unless specified on the plans or in the Supplemental Technical Specifications as solid wall pipe shall be perforated pipe as specified in ASTM F 758. Solid wall pipe shall be in accordance with Section 121.

503.5 PIPE JOINTS AND FITTINGS

503.5.1 All pipe and fitting joints shall be the rubber gasket type in accordance with Section 121. No "open joints" will be permitted on the subdrain pipe.

503.5.2 All fittings used on subdrain piping shall be the rubber gasket type, having the same or better strength as the pipe required and be approved by the pipe manufacturer for use on the pipe.

503.6 SUBDRAINAGE MANHOLES

Subdrain manholes shall be as detailed on the plans and shall be in accordance with Section 920.

503.7 FILTER AND DRAIN MATERIALS

503.7.1 A separator (membrane type) geotextile fabric as specified on the plans or in the Supplemental Technical Specification shall be used to encase the gravel drain material.

503.7.2 Gravel drain material shall consist of a material complying with the following gradation, and having the same or similar gradation curve as defined by the specification limits when graphically plotted on a standard aggregate gradation chart.

503.8 PLACEMENT

503.8.1 The area in which the subdrain is to be installed shall be backfilled, compacted and re-excavated or excavated to the line and grade shown on the plans for the drain material.

503.8.2 The geotextile fabric shall be placed in the trench so as to form a continuous cover on all four (4) sides of the gravel drain material after it is placed, with a minimum of a one-foot (1') overlap on the top of the gravel. If the length of the subdrain is longer than the geotextile fabric, the fabric may be installed with a two-foot (2') overlap with the upstream end laid under the downstream end.

503.8.3 The gravel drain material shall be placed in the bottom, on top of the fabric, up to or a few inches above the grade of the pipe. The pipe shall be installed to the line and grade shown on the plans or as authorized by the ENGINEER. Gravel drain material shall be placed around and on top of the pipe as shown on the plans. The geotextile fabric shall be placed over the top of the gravel with a minimum of a one-foot (1') overlap.

503.8.4 The upstream end of the subdrain pipe shall be left open until the placement steps outlined above have been completed. Water shall be introduced into the upstream end of the pipe to flush out any debris in the pipe. The amount of water needed will

depend on the condition of the pipe. After flushing the end of the pipe shall be capped and the gravel drain material and fabric placed around the end of the pipe.

503.8.5 Upon completion of the above steps, one foot (1') of fill shall be placed over the subdrain area and additional fill placed and compacted as specified for fill, or subgrade, etc. The first foot of fill over the subdrain will not be tested for compaction.

503.9 SUBMITTALS

The CONTRACTOR shall submit the information specified in Section 1502 on the pipe, fittings, gravel, and fabric.

503.10 MEASUREMENT AND PAYMENT

503.10.1 Subdrain shall be measured by the linear foot along the centerline of the pipe and through all fittings.

503.10.2 Payment for subdrain shall be made at the contract unit price per linear foot complete in place which price shall include all equipment, labor and materials required to excavate and install the pipe, fittings, gravel drain material, and geotextile fabric.